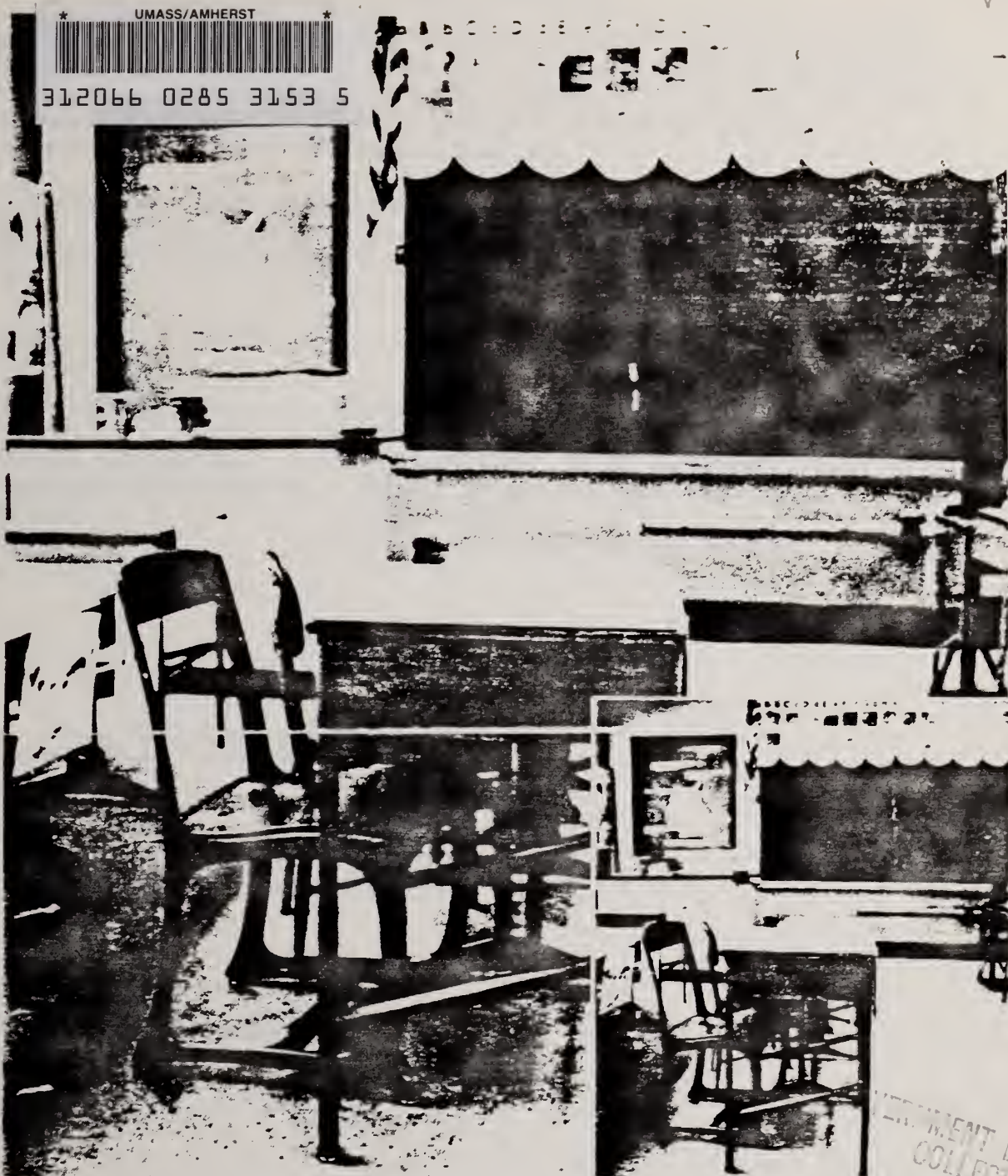


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Beyond Capacity: Accommodating Growth in Sharon Schools

May 1987



Metropolitan Area
Planning Council

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ABOUT THIS REPORT

The Metropolitan Area Planning Council is the officially designated regional planning agency for the 101 cities and towns of metropolitan Boston. The Council helps its member communities plan in the areas of economic development, land use, housing, population growth, transportation, and environmental quality.

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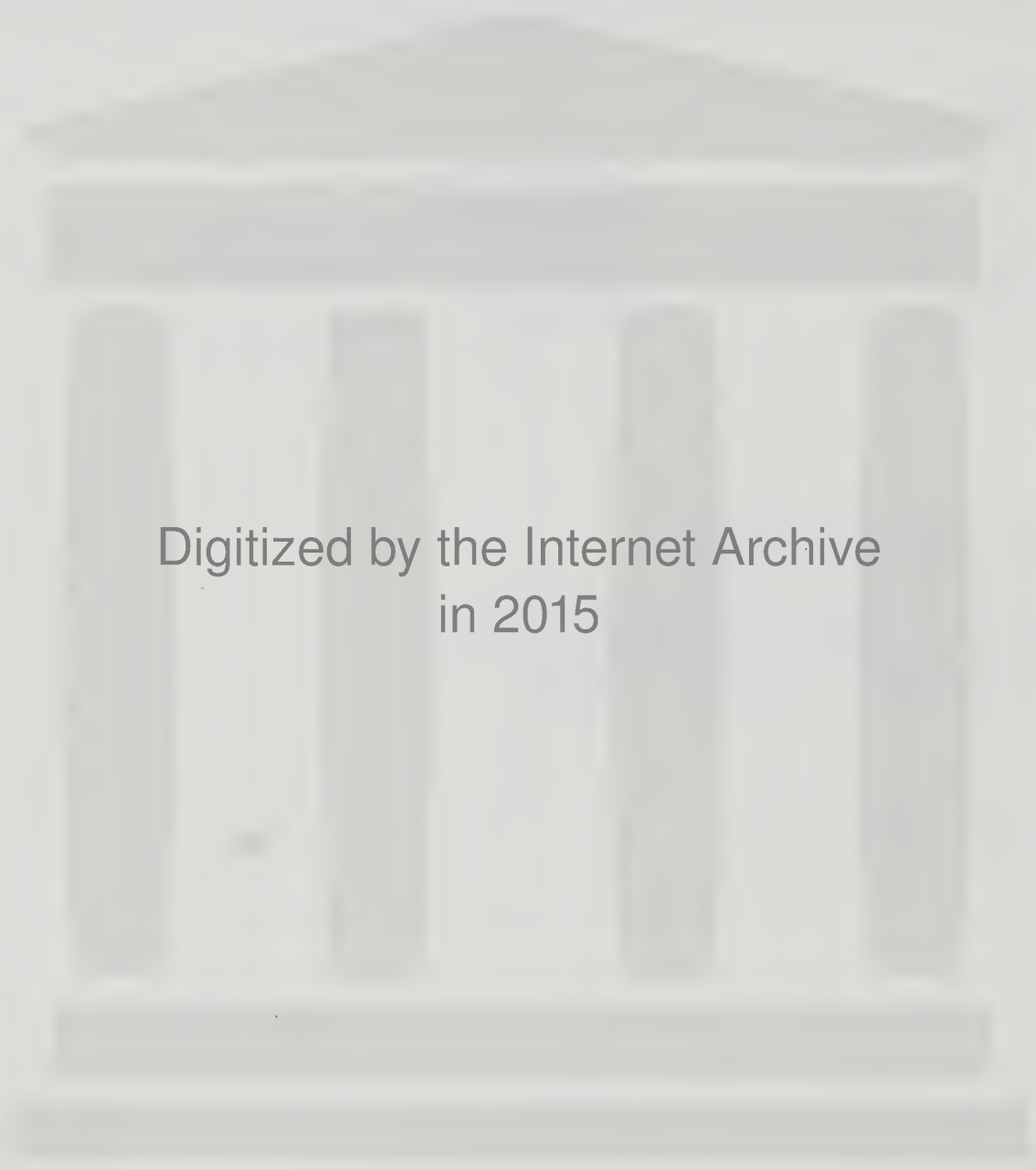
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EXECUTIVE SUMMARY

The Town of Sharon can expect a steady increase of students in its elementary schools over the next ten years. By 1997 we estimate that enrollment will be some 400 students above that in 1986. Sharon's overall population will approach 19,000 by 2,000 with large percentage gains in the number of young children, middle-aged and elderly.

Two very different methods are used to analyze the potential for growth in the school districts, a demographic model and a build-out scenario.

The demographics model is based on the relationship between recent enrollment and births within each school district combined with an assumed rate of future development. Results from this model show a net increase of 416 students over the coming ten years, assuming that past relationships remain unchanged. Gradual enrollment increases are predicted in the junior high, while senior high enrollment is forecast to rise through 1994 and then drop to a level just below that in 1986.

The build-out analysis is a qualitative illustration of the impact future residential development may have on elementary school enrollment. This analysis is based on privately owned land vacant and available for development within each school district. A rate of growth similar to the previous four years will bring an additional 471 elementary school students into the public schools. However, the build-out method does not account for the aging of present students who will leave the school system

residents. Therefore, the build-out model overcounts future enrollment and the two models estimate similar results.

Though the application of the demographic and build-out methods project a similar magnitude of enrollment growth, they differ on the relative impacts within the town's three school districts. Each approach predicts that the largest future enrollment growth will be seen in Heights. The demographic model shows moderate growth in Cottage Street and the lowest growth occurring in the East district. The build-out model shows East with the second largest potential for growth and Cottage Street with the smallest growth potential.

	Demographic Analysis	Build-out Analysis
HEIGHTS	179	211
COTTAGE STREET	143	113
EAST	94	147
TOTAL INCREASE	416	471

INTRODUCTION

Physical Overview

Located some 20 miles south of downtown Boston, the Town of Sharon stretches over 15,432 acres, of which 530 are bodies of water, 708 are fresh water wet lands, and 14,194 are dry lands. The most striking physical feature in the town is the centrally located 353-acre Massapoag Lake.

Large tracts of conservation and recreational lands as well as both publicly and privately owned open spaces are still found in Sharon. The Borderlands State Park, spanning Sharon and neighboring Easton, includes 866 acres nestled near Sharon's southeast corner. Nearly 1,600 acres are registered under the Commonwealth's Chapter 61a Farmland Assessment Act which provides tax benefits in return for maintaining undeveloped agricultural parcels. By far the largest area of so-called Chapter 61a lands is known as the "Kendall Property," which, as of January, 1987 encompassed approximately 1,200 acres on the western portion of town. Also on the west side, and formally part of the Kendall holdings, the Massachusetts Audobon Society owns over 950 acres. Open space is available for five country clubs and sports clubs (4 privately owned, 1 town owned), as well as three youth camps. Two of the camps are owned by national organizations, the Salvation Army and the Knights of Pythias.

The first home in Sharon was developed by 1658. In 1661 nearly 30 families lived in the area. By 1900 Sharon had been an incorporated town for 117 years, and was home to 2,060 residents. Growth was slow, and the town's population by the end of World War II exceeded 4,000.

In its early years, Sharon was an industrial town. Taking advantage of power generated from available water resources, leather tanneries and cotton mills flourished as did small factories manufacturing both durable and non-durable goods for use by townspeople and neighboring communities. Entering the Civil War period, Sharon's labor force was divided evenly between farming and industry and trade.

The advent of transportation improvements and centralized mass production at the outset of the 20th century caused the decline of many of the small manufacturing enterprises in Sharon. Conversely, the proliferation of automobiles, improved roadways and passenger transit has been the core of Sharon's commuter economy since the Second World War.

Starting with the development surge following the War and continuing to the present day, Sharon has quadrupled in population, growing to a sophisticated multi-community commuter center of 16,000 people who live in more than 4100 households. The 1980 United States Census reported that 85% of Sharon's working residents rely on a motor vehicle to commute and 82% work outside of Sharon. In metropolitan Boston, just 56% of all workers are employed outside of their city or town of residence.

Growth into a significant "bedroom community" has forever changed the Sharon landscape. From 1951 to 1971, the acreage of cleared agricultural land as reported by the MacConnell Land Use Surveys declined by 66% and forest land declined by 10%. From 1971 to 1980, the pace of these trends slowed somewhat as acreage of agricultural and forest lands each declined an additional 6%.

To maintain the amenity of available open space in Sharon, the town has adopted a preservation policy. Currently, 1,802 acres, greater than 11% of town lands, are publicly owned open space or recreational sites.

Elementary Schools in Sharon

The rural-suburban ambiance of Sharon, coupled with easy access to Boston and Route 128, makes the town attractive to commuters and families with young children who desire a lifestyle not available in an urban atmosphere. Consequently, significant development activity has paralleled the recent surge in the regional real estate market as many young couples born in the post-war era purchased homes and began families. This dynamic growth has, in turn, raised enrollments in Sharon's three public elementary schools to the maximum physical capacity of the system consistent with quality education.

The taxpayers of Sharon currently support three elementary schools, East, Heights, and Cottage Street. Continued immigration and additional births to families who have recently moved to town will require a significantly larger elementary school system than is presently available.

18 full classrooms. As its name implies, this school district lies on the eastern part of town. Significant development activity has been underway in East for several years, and many new homes are being built.

The Cottage St. district covers the central portion of the town. The 16 room school building serves substantial portions of Sharon's older neighborhoods, including areas with lot sizes of 1/2 and 1/4 acre - the smallest sub-divisions found in town.

The Western Heights district also includes the older areas in Sharon, found on the east side of the district. The Interstate-95 highway slices through the western edge of Heights near the Foxboro and Walpole borders; acreage around the highway contains the remaining industrial sites in the town. The Kendall Property is primarily in Heights, and stretches into the northwest section of Cottage St. as well. Largely due to the presence of the Kendall lands and Audubon Society holdings, Heights is the least developed of Sharon's three school districts.

TABLE 1
CAPACITY OF PUBLIC ELEMENTARY SCHOOLS IN SHARON

<u>School</u>	<u>Classrooms</u>	<u>Capacity*</u>	<u>Enrollments/1986</u>
East	18	450	444
Heights	14	350	350
Cottage St.	15	375	389
Totals	47	1,175	1,183

*Notes: The capacity is based on 25 students per classroom, and by not converting art rooms into classrooms. These standards are regarded by senior School Department staff as necessary for quality education.

Source: Sharon School Department.

Purpose of This Study

The primary purpose of this study is to assist the Sharon School Classroom Assessment Committee in drawing conclusions and making recommendations regarding classroom needs for the school system. Staff of the Metropolitan Area Planning Council (MAPC) examined the potential for elementary school enrollments over the coming 10 years through two distinct perspectives.

We first forecast elementary school enrollments by carefully constructing a demographic analysis of Sharon's recent past. This method is mathematical, based on data gathered from the town census and the school department. We assume that the characteristics of people who will live in each school district in Sharon over the next 10 years will be typical of the people who have been living in the districts over the previous 10 years. Discussed in more detail in Chapter II, the traits we are referring to include the average rate couples give birth to children, rate of private school attendance, and the rate that families with young children enter and leave the town.

The second method is a projection of elementary school enrollment attributable to new development during the next 10 years. As reviewed in Chapter III, this analysis is predicated on a series of assumptions regarding the availability of undeveloped land by school district, and the age and size of families who will be moving into the newly developed homes.

complement the elementary school growth models. Chapter I is a five-year population forecast for Sharon, divided into 18 age cohorts. This overview places the projections of elementary school growth in a townwide context. In addition, the Board of Selectmen and other town officials will also find the analysis and conclusions about overall population trends useful in planning the water, sewer, transportation, public safety, recreation, and other needs of Sharon.

Sources for introduction:

1. MAPC, Sharon Town Profile, 1985.
2. Philip Herr and Associates, Sharon Massachusetts Open Space and Recreation Plan, 1986.
3. Sharon League of Women Voters, Town Government Handbook, 1974.

TOWN OF SHARON POPULATION FORECAST BY AGE GROUP

The town of Sharon has increased in population every decade of this century, though its population remains well below 20,000. Like many surrounding communities, its period of greatest population growth occurred in the years immediately following World War II. During the 1950s Sharon more than doubled in size. However, population growth slowed considerably in the following decades, particularly in the 1970s, when the increase was just 10 percent.

Families with young children relocating to Sharon have traditionally been the major source of population increase. With the very large post-war "baby boom" generation currently at an age typical for bearing children, the rate of population growth is again on the upswing. The town census showed 15,421 residents of Sharon as of January 1987, an increase of 13 percent since 1980.

Federal versus Town Residency Definitions

If the town and federal censuses are made compatible, there would probably be 14,800 people defined as Sharon residents. The town census and the federal census offer different definitions of residence. For the federal census, college students, military personnel, and persons in group quarters report their actual residence rather than the legal residence, if different. In contrast, the town definition of residence is based a person's legal or voting address.

A second difference in the definition of residence is the counting of so called "snowbirds," persons who spend the coldest six months somewhere in the sunbelt and return to Sharon for the balance of the year. The federal census, taken on April 1st, would count most "snowbirds" in their sunbelt winter homes rather than in Sharon.

Both differences in definitions of residence subtract from Sharon's population count in the federal census. About 72 percent of all Sharon residents 18 to 21 years old go to a four-year college; a large majority of such students do not live at home. Based on the 1987 town census count of 958 persons of those ages, probably 600 are presently away from their parents' home attending school. We are unable to estimate the number of Sharon residents who were counted in their southern home at the time of the 1980 federal census. Due to the considerable income required to maintain two homes and live "elsewhere" for six months, the "snowbird" count is probably smaller than college students.

Sharon Age Group Changes: 1970-1980

Table 2 on the following page presents the 1970 and 1980 federal census and 1987 town census population counts by age group for Sharon residents. Table 3 shows the numeric and percentage changes between the 1970 and 1980 federal censuses and between the 1980 federal and 1987 town census.

For the most part, population changes among Sharon's age groups mirrored regional trends during the last decade. Important shifts included substantial population decline among residents under 14 years of

age and a smaller loss in the number between 40 and 49 years old. The former reflects the large drop in fertility rates during the decade and the latter is due to the decline in births during the Great Depression.

Sharon's age group changes also show the dramatic influence of the post-war "baby boom" and increasing life expectancy. The rate of population growth among Sharon residents 20 to 39 years old and 75 years old and over increased dramatically during the 1970s. However, growth in the number of very old was small, while the number of young adults increased significantly. Unlike regionwide population changes, Sharon residents 55 to 74 years of age increased dramatically in both percentage and numeric terms.

TABLE 2
POPULATION SIZE OF AGE GROUPS IN SHARON

<u>Age Group</u>	<u>1970</u>	<u>1980</u>	<u>1987</u>
0- 4	1,019	887	1,116
5- 9	1,354	1,088	1,120
10-14	1,563	1,311	1,098
15-19	1,214	1,248	1,341
20-24	559	725	1,097
25-29	714	962	879
30-34	742	1,330	1,335
35-39	853	1,216	1,634
40-44	972	896	1,382
45-49	912	809	906
50-54	768	820	715
55-59	504	698	758
60-64	347	552	666
65-69	263	343	494
70-74	228	269	337
75-79	175	217	248
80-84	96	140	175
85+	84	90	120
Total	12,367	13,601	15,421

Sources: U.S. Census of Population 1970 and 1980.
General Population Characteristics. Massachusetts.
Sharon Town Census. Office of the Town Clerk.
January, 21, 1987.

TABLE 3
CHANGE IN SHARON'S AGE GROUPS: 1970-1980

<u>Age Group</u>	<u>Numeric Change</u>	<u>Percent Change</u>
0- 4		
5- 9	-132	-13%
10-14	-266	-20
15-19	-252	-16
20-24	34	3
25-29	166	30
30-34	248	35
35-39	588	79
40-44	363	43
45-49	-76	-8
50-54	-103	-11
55-59	52	7
60-64	194	38
65-69	205	59
70-74	80	30
75-79	41	18
80-84	42	24
85+	44	46
	6	7

CHANGES IN SHARON'S AGE GROUPS: 1980-1987

<u>Age Group</u>	<u>Numeric Change</u>	<u>Percent Change</u>
0- 4		
5- 9	229	26%
10-14	32	3
15-19	-213	-16
20-24	93	7
25-29	372	51
30-34	-83	-9
35-39	5	0
40-44	418	34
45-49	486	54
50-54	97	12
55-59	-105	-13
60-64	60	9
65-69	114	21
70-74	151	44
75-79	68	25
80-84	31	14
85+	35	25
	30	33

Source: Calculations by the Metropolitan Area Planning Council.
Original source of data listed on table 1.

Sharon Age Group Changes: 1980-1987

Since 1980 the pace of new residential development has increased while the rate of births per woman has stabilized. The result has been the traditional population growth of families with young children in Sharon. However, certain attributes of Sharon's newcomers have changed; now they are mostly in the older childbearing and rearing age groups, while population has actually declined in the youngest (25 to 34 years old). This shift has probably been caused by Sharon's high new home values being affordable by primarily dual-income professional families. Such families tend to delay the age of their first child until well after the age of thirty. Differing federal and town census definitions of residence for college students discussed earlier probably accounts for the dramatic increase among those 20 to 24 years old.

In general, other age group changes appear similar to those which occurred in the previous decade. The small size of the "baby bust" generation of the 1960s and 1970s is reflected in population decline or limited growth in persons 5 to 19 years old. The small number of persons born during the Great Depression produced a loss or limited population increase among those between 50 and 59 years old. Those persons 60 years old and over are growing at a rapid pace - more than 400 additional residents since 1980.

Forecasting Method

We now turn from a discussion of historical changes in Sharon's population to a forecast of its future changes. In making population

projections for Sharon we used a lifetable-population projection program called "Halley," developed by Ned Levine of the Graduate School of Architecture and Urban Planning of the University of California at Los Angeles (UCLA).

The "Halley" program has three parts: 1) a life expectancy table; 2) an age-structure model; and 3) a population projection. The first part constructs a lifetable using mortality and population data for each age group. The second part models the age structure by assuming that the population has been growing at a constant rate for some indefinite period back in time. The third part utilizes survival rates from the lifetable and allows the addition of fertility and migration assumptions to produce a 10-year population projection. By changing assumptions, we can construct different projections. As with all models, the techniques are approximations, using simplifying assumptions. The reader should be careful in drawing conclusions from these forecasts and under no circumstance should a model be considered an "an accurate forecast of the future."

Required Data

The "Halley" program requires the following data for the same year (or as close as possible):

1. Number of female deaths for each age group.
2. Number of male deaths for each age group.
3. Number of females in each age group.
4. Number of males in each age group.
5. Number of females in each age group 10 years earlier.
6. Number of males in each age group 10 years earlier.

Data for inputs 1 and 2 were obtained from the Massachusetts Department of Public Health, Division of Health Statistics and

Research. A five-year average of deaths centered around 1980 was used because of the small number in most age groups. Data for inputs 3 and 4 were taken from the 1980 federal Census of Population. Data for inputs 5 and 6 were available from the 1970 federal Census of Population.

The data listed above and used by the Halley program to develop our population projections were supplemented by the 1987 town census population count by age group, town census information identifying recent in-migrants and out-migrants, and by information on the prospective purchasers in several large residential developments now underway in Sharon. To prevent the development of two inconsistent sets of forecasts (total population by age groups and school enrollment by grade level), the school age population for 1990 was forced to generally conform with our school enrollment forecast. An initial set of population projections by age groups produced by the Halley program were modified in light of the data sources given above. Our population forecasts by age groups were produced for 1990 and 1995 consistent with the federal definition of residency.

TABLE 4

SHARON POPULATION FORECAST BY AGE GROUP: 1990 and 2000

<u>Age Group</u>	<u>1990 Number</u>	<u>2000 Number</u>
0- 4	1,226	1,224
5- 9	1,187	1,187
10-14	1,141	1,601
15-19	1,079	1,103
20-24	781	805
25-29	1,027	1,108
30-34	1,754	1,754
35-39	2,115	2,326
40-44	1,623	1,948
45-49	1,087	1,413
50-54	829	1,270
55-59	877	1,061
60-64	774	734
65-69	475	575
70-74	353	460
75+	591	768
Total	16,919	19,337

Source: Metropolitan Area Planning Council.

TABLE 5

PROJECTED CHANGE IN SHARON'S AGE GROUPS: 1980-1990

<u>Age Group</u>	<u>Numeric Change</u>	<u>Percent Change</u>
0- 4	339	38%
5- 9	99	9
10-14	-170	-13
15-19	-169	-14
20-24	56	8
25-29	65	7
30-34	424	32
35-39	899	74
40-44	727	81
45-49	278	34
50-54	9	1
55-59	179	26
60-64	222	40
65-69	132	38
70-74	84	31
75+	144	32

PROJECTED CHANGES IN SHARON'S AGE GROUPS: 1990-2000

<u>Age Group</u>	<u>Numeric Change</u>	<u>Percent Change</u>
0- 4	-2	0%
5- 9	0	0
10-14	460	40
15-19	24	2
20-24	24	3
25-29	81	8
30-34	0	0
35-39	211	10
40-44	325	20
45-49	326	30
50-54	441	53
55-59	184	21
60-64	-40	-5
65-69	100	21
70-74	107	30
75+	177	30

Source: Metropolitan Area Planning Council.

TABLE 6

SHARON IN AND OUT MIGRANTS: 1985-1986

<u>AGE GROUP</u>	<u>IN-MIGRANTS</u>	<u>OUT-MIGRANTS</u>	<u>"NET" MIGRANTS</u>
0-4	422	19	
5-9	180	48	+403
10-14	113	53	+132
15-19	75	75	+ 60
20-24	63	126	+ 18
25-29	168	238	- 63
30-34	322	187	- 70
35-39	292	124	+135
40-44	147	95	+168
45-49	51	53	+ 52
50-54	29	36	- 2
55-59	38	42	- 7
60-64	28	57	- 4
65-69	40	58	- 29
70-74	36	41	- 18
75-79	33	39	- 5
80-84	21	29	- 6
85+	20	90	- 8
			- 70
Total	1,363	1,392	-29

Source: Sharon Town Census. Office of the Town Clerk.
 Age group calculations by the Metropolitan Area Planning
 Council.

CHAPTER II

THE SHARON SCHOOL CLASSROOM NEEDS ASSESSMENT STUDY: THE DEMOGRAPHIC MODEL

The post-World War II baby boom during the 1950s and early 1960s was followed by a rapid decline in the number of births, especially during the 1970s. Communities throughout metropolitan Boston, including Sharon, found themselves first adding classrooms to accomodate additional students, and then closing schools a decade or so later as the number of students fell dramatically. Today, another enrollment surge is in progress, partly the reflection of the baby boom generation now having their own children and partly a reflection of the continuing growth in Sharon's young adult population.

Our demographic forecasting model is constructed as a series of data inputs which build upon each other to reach the final stage, an annual forecast of enrollment by school district and grade level. The primary inputs to our model are readily available to most communities - annual enrollment by grade level and annual births. We list below the major elements of our model, in order of their use, and then discuss how each element was developed. A flow chart on the following page illustrates how the elements of the model are linked to one another.

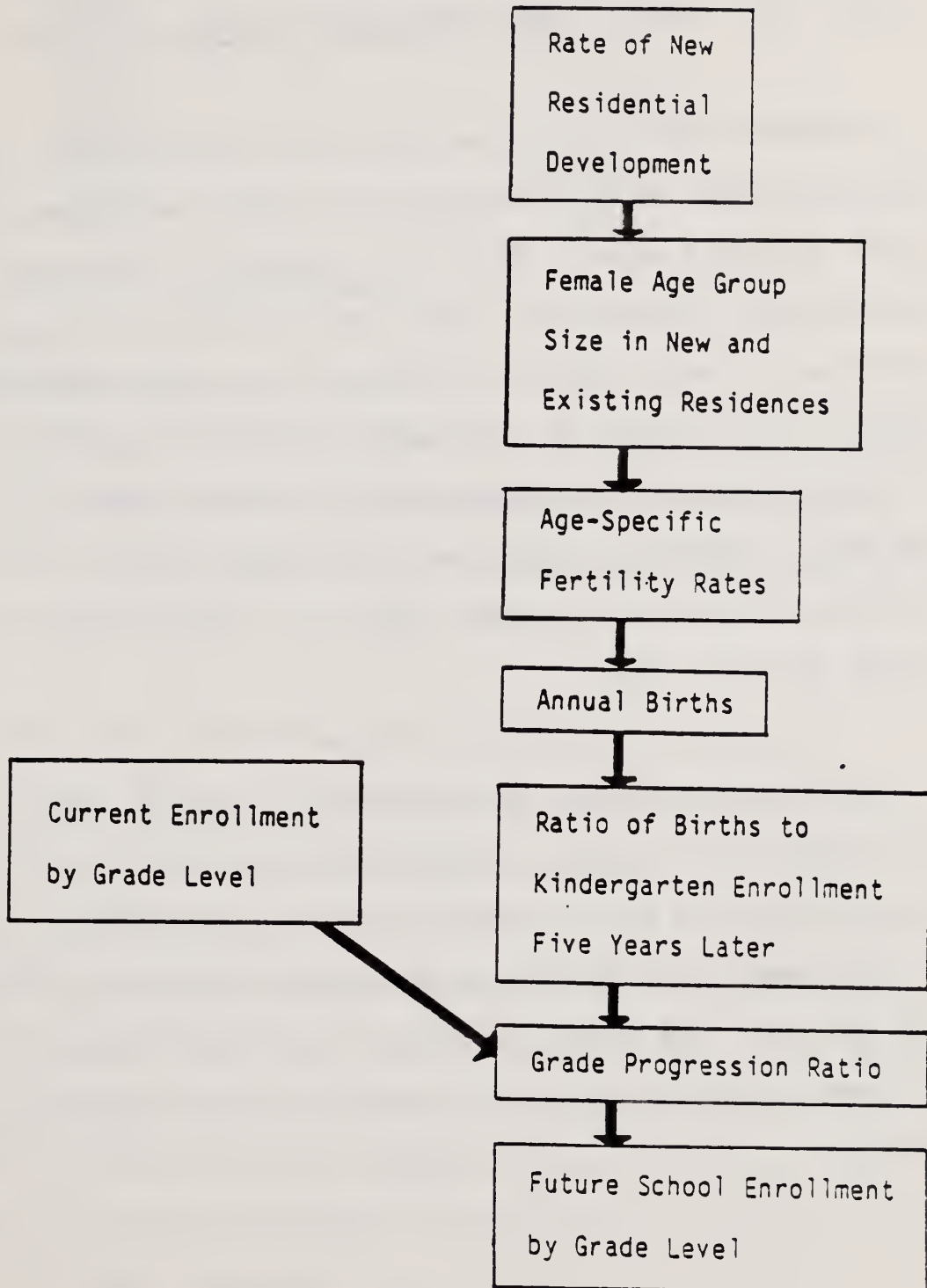
The elements of the forecasting model include:

1. Assumed future rate of residential development.
2. Projected annual size of the six major female childbearing age groups.

3. Number of births by the age of the mother for the most recent year.
4. Forecast of annual births obtained by multiplying element 2 with 3.
5. Relationship between the level of births and kindergarten enrollment five years later.
6. Current enrollment by grade level.
7. Extent to which once in school, students stay in, and the extent to which new students enter school after kindergarten, or the grade progression ratio.
8. Annual forecast of enrollment by school district and grade level.

The basic forecast period for our model is five years. Assuming children in kindergarden are five years old, the entering kindergarden class in 1997 will be born in 1992.

HISTORICAL TREND BASED
ENROLLMENT FORECASTING MODEL



Source: Metropolitan Area Planning Council.

Rate of New Residential Development

Predicting the future rate of residential development is the initial step in our enrollment forecasting model. This task was made easier by the need to consider only new single family homes. School children are not present in Sharon's apartments and condominiums in significant numbers. (Bill Wendel, Sharon Demographic Analysis, 12/17/85).

Between 1983 and 1986, the Sharon Building Department issued an average of about 130 building permits for single family homes annually (refer to Table 7 below). The rate of residential development observed over the past four years will likely continue during the remainder of this decade and the early 1990s as real estate professionals consulted in the course of this study do not anticipate a local building slump. Implicit in this assumed pace of development is that the baby-boom generation will continue to form new households at their present rate and, as they bear children, will move into suburban communities with available land at least through the early 1990s.

We assume that each of the permits issued results in the construction and occupancy of a new home. As accurate forecasts of year-to-year fluctuations in the rate of construction are impossible, we further assume that development is evenly spaced at a constant annual rate of 130 new homes per year. The recent proposal to "cap" future residential development in Sharon at 120 units annually is very close to this average.

TABLE 7
BUILDING PERMITS ISSUED FOR
SINGLE FAMILY HOMES IN SHARON
1977 - 1986

1977	103
1978	98
1979	97
1980	54
1981	67
1982	60
1983	122
1984	106
1985	151
1986	126

Source: Sharon Building Department.

Female Age Group Size

We now need to know the characteristics of the occupants of the new single family homes, and more precisely, how many children these new residents are likely to have. The recent past probably provides the best evidence as to the future.

The Town Clerk of Sharon maintains and regularly updates a computerized town census. A listing of some 2,100 newcomers to Sharon since December of 1984 was obtained from this census. All female newcomers, including those who were married and never married, were placed into five-year age groups. Females whose destination was an apartment, condominium, or low-income housing complex were removed from the sample. The result is shown in Table 8. The vast majority the females were in the prime years for bearing children, between 25 and 39. No significant differences were noted by elementary school district in the proportion of newcomers within each age group.

TABLE 8

FEMALE NEWCOMERS TO SHARON
OF CHILDBEARING AGE: 1985-1986

<u>AGE</u>	<u>NUMBER</u>	<u>PERCENTAGE</u>
15-19	0	0 %
20-24	30	7 %
25-29	94	20 %
30-34	152	33 %
35-39	132	28 %
40-44	57	12 %
Total	465	100 %

Source: Sharon Town Census. Office of the Town Clerk.

Annual Source of New Sharon Single-Family Households

By multiplying the data contained in Table 9 by our assumed yearly growth of 130 new households, we derive a future annual increase in the number of women in childbearing ages found in Table 10 below. The number in each age group has been held constant except for the annual addition of 130 women (or households). Our procedure did not adjust for the annual "aging" of females who remain as residents nor could it incorporate the change on the existing female age structure from household turnover.

TABLE 9
ANNUAL SOURCE OF ADDITIONAL SHARON HOUSEHOLDS

<u>AGE</u>	<u>DISTRIBUTION</u>	<u>ADDITIONAL WOMEN (OR HOUSEHOLDS)</u>
15-19	0 %	0
20-24	7 %	9
25-29	20 %	26
30-34	33 %	43
35-39	28 %	36
40-44	12 %	16
Total	100 %	130

TABLE 10
PROJECTED NUMBER OF SHARON WOMEN
IN CHILDBEARING AGE GROUPS

<u>AGE</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>
15-19	637	637	637	637	637	637	637
20-24	514	523	532	541	550	559	668
25-29	460	486	512	538	564	590	616
30-34	713	756	799	842	885	928	971
35-39	842	878	914	950	986	1022	1058
40-44	691	707	723	739	755	771	787
Total	3,857	3,987	4,117	4,247	4,377	4,507	4,637

Source: Metropolitan Area Planning Council.

Age-Specific Fertility Rates

The third stage of our enrollment forecast requires estimating the number of future births in each of the six major childbearing age groups displayed above. The number of births in Sharon by the age of the mother was obtained from Massachusetts Department of Public Health, Division of Health Statistics and Research. The latest year available was 1985. The number of female Sharon residents in the six age groups was obtained for

that same year from the Town Census by the Sharon Town Clerk. By multiplying the number of births in each age group by the number of women in that same group, age-specific rates of births per thousand women were derived which are shown in Table 11. We assume that the fertility rates observed in 1985 will remain unchanged during the forecast period. This assumption is reasonable since the total fertility rate has been very stable in Massachusetts over the last ten years. However, certain age-specific fertility rates have been gradually increasing, especially among women between the ages of 30 and 39, and declining among those aged 20 to 24. We did not attempt to predict if this shift will continue, its extent, and its applicability to the Town of Sharon.

TABLE 11
BIRTHS BY AGE OF MOTHER
SHARON: 1985

<u>AGE</u>	<u>BIRTHS</u>	<u>WOMEN</u>	<u>RATIO PER THOUSAND</u>
15-19	4	642	6.2
20-24	11	507	21.7
25-29	85	477	178.2
30-34	99	778	127.2
35-39	26	734	35.4
40-44	3	600	5.0
Total	228	3738	61.0

Sources: Massachusetts Department of Public Health. Division of Health Statistics and Research. Unpublished Data.
Sharon Town Census. Office of the Town Clerk.
Fertility ratios calculated by the Metropolitan Area Planning Council.

Annual Births

We are now ready to use the information developed over the first three stages of our enrollment forecasting model. The annual number of births were forecast by multiplying the projected number of women in six major childbearing age groups by the age-specific fertility rates. Future births were allocated to the elementary school districts based on their proportion of townwide births during the last five years. These five-year proportions were: Cottage - 41 percent; East - 29 percent; and Heights - 30 percent. Birth forecasts for 1987 through 1992 were combined with past births from 1982 through 1986; the results are presented in Table 6 below.

TABLE 12
ACTUAL AND PROJECTED ANNUAL BIRTHS
BY SCHOOL DISTRICT AND YEAR

	<u>COTTAGE</u>	<u>EAST</u>	<u>HEIGHTS</u>	<u>TOTAL</u>
1982	106	75	68	249
1983	85	73	79	237
1984	99	51	66	216
1985	100	65	68	233
1986	86	75	59	220
1987	103	73	76	252
1988	109	77	80	266
1989	114	81	83	278
1990	119	84	87	290
1991	125	88	91	304
1992	130	92	95	317

Note: Past births were coded to school district through street address listings obtained from the Sharon Town Census. Total 1986 births are estimated from 11 months of certificates.

Sources: Sharon Town Census. Office of the Town Clerk.
Birth projections by the Metropolitan Area Planning Council.

Kindergarten Enrollment

Next, we examine the past relationship between births and kindergarten enrollment five years later. We assume that the basic demographic patterns in each school district persist over time. Our forecasting model utilizes a nine-year average for each district, since these ratios vary considerably from year to year.

Over the nine-year period, each school district has lost potential kindergarten students after they were born in Sharon, though in some years the ratio has been positive. A ratio of less than one indicates that there was a net out-migration of families with preschool children between the year of birth and five years later. Conversely, a ratio greater than one shows that the district had a net immigration of children during the same period. The nine-year average for Cottage St. is 78 percent, 97 percent for East, and 88 percent for Heights (see Table 13).

Why should fewer students enter kindergarten than were born five years earlier? A significant number of Sharon families appear to move to another community before the school age of their first child. This pattern is especially evident in the Cottage St. district, which contains a disproportionately high number of older homes worth less than the townwide average. Several local real estate professionals have reported that it is typical for young families to initially locate in the Cottage district and then trade up to a more expensive home in East as their families grow and their children reach school age. This pattern is reflected in the positive ratios in East district during the last four years. The opening of a large new subdivision (Hampton Estates) probably attracted a

significant number of families with preschool age children, from within Sharon and surrounding communities.

The correlation of less than one (1) between births and kindergarten enrollment five years later may be changing, although it is too soon to be certain. Examining Sharon's immigration and outmigration patterns in 1985 and 1986 shows a very large increase in young children, a net increase of 403 in the pre-kindergarten age bracket of 0 - 4 over the last two years (see Table 6 on page 20). The five year birth to kindergarten spans of 1985 - 1990 and 1986 - 1991 will probably show townwide ratios exceeding 1.0.

The recent data may be a harbinger of a new settlement pattern in town, or may be a statistical fluke which will even out over time. We chose to use the long-term nine year averages with this model. However, the town should monitor future migration patterns, and be aware that significantly higher birth-to-kindergarten ratios than in the recent past will lead to more elementary school students in Sharon than we project in this model.

TABLE 13
BIRTHS TO PUBLIC KINDERGARTEN ENROLLMENT
FIVE YEARS LATER

COTTAGE

	<u>BIRTHS</u>	<u>K. ENROLLMENT</u>	<u>RATIO</u>
1973-1978	89	61	.69
1974-1979	102	91	.89
1975-1980	81	74	.91
1976-1981	88	73	.83
1977-1982	93	67	.72
1978-1983	82	46	.56
1979-1984	94	69	.73
1980-1985	90	61	.68
1981-1986	91	93	1.02
AVERAGE			.78

EAST

	<u>BIRTHS</u>	<u>K. ENROLLMENT</u>	<u>RATIO</u>
1973-1978	65	58	.89
1974-1979	86	59	.69
1975-1980	65	50	.77
1976-1981	62	69	1.11
1977-1982	66	58	.88
1978-1983	72	75	1.04
1979-1984	64	72	1.13
1980-1985	73	76	1.04
1981-1986	65	74	1.14
AVERAGE			.97

TABLE 13 (CONTINUED)

BIRTHS TO PUBLIC KINDERGARTEN ENROLLMENT
FIVE YEARS LATERHEIGHTS

	<u>BIRTHS</u>	<u>K. ENROLLMENT</u>	<u>RATIO</u>
1973-1978	53	61	1.15
1974-1979	65	69	1.06
1975-1980	52	49	.94
1976-1981	62	46	.74
1977-1982	61	63	1.03
1978-1983	56	55	.98
1979-1984	75	48	.64
1980-1985	64	50	.78
1981-1986	78	49	.63
AVERAGE			.88

Sources: Sharon Town Census. Office of the Town Clerk.
 Sharon School Department.
 Ratios calculated by the Metropolitan Area Planning Council.

Current Public School Enrollment by Grade Level

Enrollment by grade level and by school district for the years 1977 through 1986 constitute the next input to our model. This was available through the Sharon School Department and is shown in Table 14. We used the 1986 data to initialize the enrollment forecasts.

Private School Enrollment

To predict public school enrollment, we must first discount the number of Sharon pupils we expect to be enrolled in private schools. Among Sharon families, the number of students attending private schools has been increasing, but still constitutes less than 10% of all enrollment. Private school enrollment has been especially pronounced in junior high school, with only modest and erratic increases in the elementary grades (refer to Table 15). Among all grade levels, private school attendance is highest in the Cottage Street School District.

Grade Progression Ratios

We must now measure the likelihood that enrolled pupils remain in the Sharon elementary schools, and the extent to which new students enter school after kindergarten. These patterns can be measured through grade progression ratios. Grade progression ratios are a measure of a given grade size in relation to the same class at the preceeding grade level. For example, the ratio of a third grade class of 19 when the second grade class of the preceding year had 20 children is calculated as $19/20$, or .95.

We have taken a nine-year average of these enrollment changes to smooth out year-to-year fluctuations. Table 17 displays these ratios for each grade level and school district. They are interpreted as a net migration rate. If the ratio is positive, families with school children have been moving into the district during the period; a negative ratio shows that such families have been leaving on balance.

TABLE 14

SHARON PUBLIC SCHOOL ENROLLMENT
BY SCHOOL DISTRICT, GRADE LEVEL AND YEAR

COTTAGE

	<u>K</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>TOTAL</u>
1977	81	69	90	92	99	84	515
1978	61	77	70	82	89	87	466
1979	91	65	82	74	96	91	499
1980	74	97	63	83	77	90	484
1981	73	71	92	57	85	71	449
1982	67	75	71	90	56	89	448
1983	46	61	66	67	89	53	382
1984	69	48	50	64	70	86	387
1985	61	78	50	54	66	72	381
1986	93	55	74	48	47	72	389

EAST

	<u>K</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>TOTAL</u>
1977	64	79	85	86	90	89	493
1978	58	83	79	89	88	105	502
1979	59	60	84	85	94	95	477
1980	50	60	59	80	86	95	430
1981	69	61	58	67	85	90	430
1982	58	69	60	61	65	86	399
1983	75	67	73	65	69	67	416
1984	72	76	74	74	69	77	442
1985	76	77	80	71	76	73	453
1986	74	72	86	74	69	69	444

HEIGHTS

	<u>K</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>TOTAL</u>
1977	52	67	71	72	78	66	406
1978	61	59	72	82	79	81	434
1979	69	59	56	68	68	71	391
1980	49	73	63	57	76	73	391
1981	46	55	71	75	51	76	374
1982	63	49	56	71	78	54	371
1983	55	65	50	56	75	75	376
1984	48	75	70	51	52	75	371
1985	50	52	67	70	53	46	338
1986	49	60	46	71	71	53	350

TABLE 14 (CONTINUED)

SHARON PUBLIC SCHOOL ENROLLMENT
BY SCHOOL DISTRICT, GRADE LEVEL AND YEARJUNIOR HIGH

	<u>6</u>	<u>7</u>	<u>8</u>	<u>TOTAL</u>
1977	295	248	289	832
1978	249	287	257	793
1979	273	253	290	816
1980	253	275	251	779
1981	255	251	261	767
1982	242	257	255	754
1983	227	243	260	730
1984	190	221	238	649
1985	233	188	223	645
1986	186	227	180	593

SENIOR HIGH

	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>TOTAL</u>
1977	282	269	254	234	1039
1978	265	280	241	235	1021
1979	234	246	255	229	964
1980	262	209	229	244	944
1981	244	234	201	223	902
1982	248	239	225	192	904
1983	247	244	214	227	932
1984	248	238	225	204	915
1985	224	237	237	190	888
1986	203	208	226	208	845

Notes: 1. Prior to 1981 most fifth grade students attended an intermediate school which is now closed. These students were distributed to the present elementary schools based on their portion of each year's fourth grade school enrollment.

2. All figures exclude a small number of pre-schoolers at Cottage. All annual enrollments are as of October 1st or the nearest date on which school was open.

Source: Sharon School Department.

TABLE 17
GRADE PROGRESSION RATIOS

COTTAGE

	<u>K to 1</u>	<u>1 to 2</u>	<u>2 to 3</u>	<u>3 to 4</u>	<u>4 to 5</u>
1977-78	.95	1.01	.91	.97	.88
1978-79	1.07	1.06	1.06	1.17	1.02
1979-80	1.07	.97	1.01	1.04	.94
1980-81	.96	.95	.90	1.02	.92
1981-82	1.03	1.00	.98	.98	1.05
1982-83	.91	.88	.94	.99	.95
1983-84	1.04	.82	.97	1.04	.97
1984-85	1.13	1.04	1.08	1.03	1.03
1985-86	.90	.95	.96	.87	1.09
AVERAGE	1.01	.96	.98	1.01	.98

EAST

	<u>K to 1</u>	<u>1 to 2</u>	<u>2 to 3</u>	<u>3 to 4</u>	<u>4 to 5</u>
1977-78	1.30	1.00	1.05	1.02	1.17
1978-79	1.03	1.01	1.08	1.06	1.08
1979-80	1.02	.98	.95	1.01	1.01
1980-81	1.22	.97	1.14	1.06	1.05
1981-82	1.00	.98	1.05	.97	1.01
1982-83	1.16	1.06	1.08	1.13	1.03
1983-84	1.01	1.10	1.01	1.06	1.12
1984-85	1.07	1.05	.96	1.03	1.06
1985-86	0.95	1.12	.93	.97	.91
AVERAGE	1.08	1.03	1.03	1.03	1.05

Source: Metropolitan Area Planning Council calculations from school enrollments provided by the Sharon School Department.

TABLE 17 (CONTINUED)
GRADE PROGRESSION RATIOS

HEIGHTS

	<u>K to 1</u>	<u>1 to 2</u>	<u>2 to 3</u>	<u>3 to 4</u>	<u>4 to 5</u>
1977-78	1.13	1.07	1.15	1.10	1.04
1978-79	.97	.95	.94	.83	.90
1979-80	1.06	1.07	1.02	1.12	1.07
1980-81	1.12	.97	1.19	.89	1.00
1981-82	1.07	1.02	1.00	1.04	1.06
1982-83	1.03	1.49	1.00	1.06	.96
1983-84	1.36	1.10	1.02	.93	1.00
1984-85	1.08	1.05	1.00	1.04	.88
1985-86	1.20	1.12	1.06	1.01	1.00
AVERAGE	1.11	1.09	1.04	1.00	.99

JUNIOR HIGH

	<u>5 to 6</u>	<u>6 to 7</u>	<u>7 to 8</u>
1977-78	1.04	.97	1.04
1978-79	1.00	1.02	1.01
1979-80	.99	1.01	.99
1980-81	.99	.99	.95
1981-82	1.02	1.01	1.02
1982-83	.99	1.00	1.01
1983-84	.97	.97	.98
1984-85	.98	.99	1.01
1985-86	.97	.97	.99
AVERAGE	.99	.99	1.00

SENIOR HIGH

	<u>8 to 9</u>	<u>9 to 10</u>	<u>10 to 11</u>	<u>11 to 12</u>
1977-78	.92	.99	.90	.93
1978-79	.91	.93	.91	.95
1979-80	.90	.89	.93	.96
1980-81	.97	.89	.96	.97
1981-82	.95	.98	.96	.96
1982-83	.97	.98	.90	1.01
1983-84	.95	.96	.92	.95
1984-85	.94	.96	1.00	.84
1985-86	.91	.93	.95	.88
AVERAGE	.94	.95	.94	.94

Source: Metropolitan Area Planning Council calculations from school enrollments provided by the Sharon School Department.

TABLE 19 (CONTINUED)

SHARON PUBLIC SCHOOL ENROLLMENT PROJECTIONS
BY GRADE LEVEL AND YEAR

	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>
1986	203	208	226	208
1987	169	192	195	212
1988	213	160	181	183
1989	173	202	151	170
1990	179	164	190	142
1991	174	169	154	179
1992	182	165	159	145
1993	198	173	155	150
1994	185	188	162	146
1995	221	176	176	152
1996	223	210	165	166
1997	218	212	197	155

Source: Projections by the Metropolitan Area
Planning Council.

TABLE 20

SHARON PUBLIC ELEMENTARY
SCHOOL ENROLLMENT PROJECTIONS
BY SCHOOL DISTRICT, GRADE LEVEL AND YEARCOTTAGE

	<u>K</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>TOTAL</u>
1986	93	55	74	48	47	72	389
1987	83	94	53	73	47	46	396
1988	66	84	90	52	73	48	412
1989	77	67	80	88	52	72	437
1990	78	78	64	79	89	51	439
1991	67	79	75	63	79	87	451
1992	80	68	76	73	64	78	438
1993	85	81	65	74	74	62	442
1994	89	86	78	64	75	73	464
1995	93	90	82	76	64	73	479
1996	98	94	86	81	77	63	498
1997	101	98	90	84	82	76	532

TABLE 20 (CONTINUED)

SHARON PUBLIC ELEMENTARY
SCHOOL ENROLLMENT PROJECTIONS
BY SCHOOL DISTRICT, GRADE LEVEL AND YEAR

EAST

	<u>K</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>TOTAL</u>
1986	74	72	86	74	69	69	444
1987	73	80	74	89	76	72	464
1988	71	79	82	76	91	80	479
1989	49	76	81	85	79	96	466
1990	63	53	79	83	87	83	449
1991	73	68	55	81	86	92	455
1992	71	79	70	57	84	90	450
1993	75	76	81	72	58	88	450
1994	79	81	79	83	74	61	457
1995	81	85	83	81	86	78	495
1996	85	88	87	86	84	90	520
1997	89	92	91	90	88	88	538

HEIGHTS

	<u>K</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>TOTAL</u>
1986	49	60	46	71	71	53	350
1987	60	54	65	48	71	70	369
1988	70	66	59	68	48	70	381
1989	58	77	72	62	68	47	385
1990	60	64	84	75	62	67	413
1991	52	66	70	87	75	61	412
1992	67	58	72	73	87	75	432
1993	70	74	63	75	73	87	442
1994	73	78	81	65	75	72	445
1995	77	81	85	84	65	75	467
1996	80	85	88	89	84	65	491
1997	84	89	93	92	89	83	529

Source: Projections by the Metropolitan Area Planning Council.

working backwards from this maximum development potential, and given recent development history in the town and the greater Boston area, the likely development to be seen over the coming ten years will fall between 1,000 to 1,800 homes. The wide range reflects the uncertainty of future consumer demand in the regional housing market. As will be discussed below in more detail, the extension of current growth rates will bring the development of just under 1,300 homes in the next 10 years.

Methods and Assumptions Used to Develop the Maximum Build-Out

The Sharon School Department supplied a map of the town's three elementary school districts. MAPC staff redrew the boundaries onto a large copy of Herr & Associates' July, 1986 Open Space and Recreation Map (scale: 1" = 1000'), and asked School Department staff to confirm the boundaries as drawn. Thereafter, all mapping work was done on the Open Space Map as presented in July and revised in October of 1986.

The gross acreage of Sharon's three school districts were measured by constructing a 400 acre overlay grid to the scale of the Herr map. This method of measuring proved 98% effective when totaled and compared to the town's known acreage.

TABLE 21
ESTIMATED ACREAGE WITHIN EACH SCHOOL DISTRICT

<u>SCHOOL DISTRICT</u>	<u>ESTIMATED ACRES</u>
Heights	5,634
Cottage St.	5,250
East	<u>4,233</u>
Total	15,117
Actual Acres in Sharon	15,558

Each unlabeled parcel on the Herr map which appeared as underdeveloped was measured by using the overlaying grid system. The probable future use of these plots were discussed with The Conservation Commission staffperson and Chair, identifying parcels which will likely be developed.

Based on these discussions, and using the Herr map and its companion October, 1986 open space inventory, parcels were listed by school district, land use, owner and size. Where parcels crossed district boundaries, the portion of land lying in each district was measured through an application of the overlay grid method. The final step to develop the basis for potential development in Sharon consisted of a series of discussions with town officials to determine where subdivisions have been approved, building permits have been granted, vacancies exist, and development proposals are pending.

For the purpose of the maximum build-out analysis, privately owned sports and country clubs, camps, lands designated under the Chapter 61A Agricultural Preservation Program, privately owned lands with conservation restrictions, and county-owned land are all considered as fully developable. We also include the open space parcels identified by Herr & Associates as desirable for conservation. These parcels lie outside of direct town control at this time. The following categories of open space are assumed to be unavailable for development:

- * Town owned open space
- * Town owned recreational facilities
- * Land now owned by the Conservation Commission
- * Public school buildings now in use
- * Cemeteries
- * Sharon's Historical District
- * Borderlands State Park
- * Audubon Society land (including the purchase of 12/31/86)

single family homes, an average of 126 per year. Despite high prices, development activity appears to be increasing; 277 permits were issued during 1985 and 1986, an average of 138 annually.

TABLE 23
BUILDING PERMITS ISSUED FOR SINGLE FAMILY HOMES:
1977 - 1986

<u>Year</u>	<u>Number</u>	<u>Year</u>	<u>Number</u>
1977	103	1982	60
1978	98	1983	122
1979	97	1984	106
1980	54	1985	151
1981	67	1986	126
		Total	984

Total 1983 - 1986: 505

Source: Town of Sharon Building Department.

Examining the number of building permits granted over the previous decade helps define the possibilities of development in Sharon over the coming 10 years. Based on the recent trend of the last four years, development may be projected to be 1,263 homes over the coming ten years. Using the last two more frenzied real estate years as reference points, the 10 year development build-out may reach 1,385 homes. Sharon's busiest year, 1985, coinciding with the peak of the boom in the Boston area housing market, suggests a capacity to develop 1,510 homes over 10 years. However, given the uncertainty of mortgage rates and sustained effective demand for single family homes in Sharon, a few years of poor economic performance may result once again in 1,000 units being developed over a 10 year period.

As a consequence of development in Sharon over the previous four years; there is strong support in town to set limits on growth. A guideline under discussion is to allow 240 new permits every two years, or 1,200 per 10 years which is in line with the most recent development history in the town.

Illustrations of 10 Year Growth

Projected growth patterns over a 10 year period are based on economic assumptions. A high-growth scenerio is predicated on an exceptionally strong real estate market which will encourage developers to bid highly for available land, and in turn, encourage owners of substantial acreage to sell their land at the high cost. High growth assumptions place Sharon well on the way towards developing its 3,158 potential lots, and implies that the local real estate market will expand far beyond the pace of the preceding four years.

A more moderate rate of future development assumes that sustained growth pressure at current levels will continue for 10 years without overwhelming the town. Land will not be purchased as quickly for development purposes as in an extremely high-growth climate, and land-owners who generally favor conservation will be less inclined to sell land if exceptionally lucrative financial returns are not offered.

The low-growth scenario is based on a more sluggish housing market than the town has experienced over past four years, thereby generating only limited pressure to develop and limited incentives for local property owners to sell. Market conditions over the next 10 years may be as great a roller-coaster as was the preceding decade. Such a downturn in demand for new housing may occur if Route 128 high-tech industries do not

town's zoning code, land available for subdivision, and the size of families who have recently moved into Sharon and purchased new homes. We then applied the model to the steady-growth scenario. As described above, this scenerio assumes the development of 1,233 housing units over the coming 10 years, 150 condominiums at MacIntosh Farms and 1,083 single family homes. The average development of 120 - 130 units is roughly in line with the development pattern in town observed over the last four years.

The Town Clerk's Office supplied us with a list of families who moved to Sharon in 1985, including 94 households located on new streets. The new streets represent a sample of recently developed single family homes in Sharon.

The 94 homes contain 66 children born between 1975 and 1985, inclusive, an average of .70 children per household. The age distribution of these children are as follows:

TABLE 25

AGE DISTRIBUTION OF CHILDREN IN NEW HOMES
Based on 1985 Sample*

A. Pre-school		B. Elementary School	
CHILD BETWEEN THE AGES OF:	PROPORTION OF DISTRIBUTION.	CHILD BETWEEN THE AGES OF:	PROPORTION OF DISTRIBUTION
0 - 1	29%	5 - 6	06%
1 - 2	08	6 - 7	11
2 - 3	03	7 - 8	08
3 - 4	15	8 - 9	06
4 - 5	05	9 - 10	02
		10 - 11	09

*Does not add to 100% due to rounding.

The striking feature in the data is that a significant number of couples are moving to Sharon as they are expecting a first child, or soon after the birth of a first child. A large proportion of children, 29%, were under one year old. The age of the mother was given in 19 of the 24 families where children were born in 1984 and 1985. Of these 19 families, six had two children and thirteen had one child. Twelve of the mothers in the one child families were 33 years old or under and the other was 35.

Based on the relatively young age of these mothers, we assume that on average each will have one additional child. We support this assumption by noting that the 1980 United States Census reported that the average Sharon household had 2.34 children. Currently, women are marrying and having children at later ages than even in the recent past. Thus, it is logical, even conservative, to assume that women who move to Sharon at the birth of their first child will have a second.

For additional support for the assumption discussed above, we examined households in our sample of 94 on new streets that contain children under 11 years old. Not counting the thirteen families with one newborn child, an average of about 1.6 young children live in those households. It is reasonable to assume this average will rise with some additional births occurring in these homes.

Based on typical child spacing patterns, we expect that the thirteen young couples will have a second child three years after the

at private schools. In 1986, 5.3% of Sharon's children of elementary school age attended private schools. By district, private school attendance was 4.4% in Heights, 8.5% in Cottage St., and 3.1% in East. The overall estimate of children was reduced by the proportion of private school attendance from each district.

TABLE 28

ESTIMATED ELEMENTARY SCHOOL CHILDREN
IN PUBLIC SCHOOLS
DUE TO FUTURE RESIDENTIAL DEVELOPMENT

<u>School District</u>	<u>Number of Children</u>
Heights	398
Cottage St.	213
East	278
Total	890

Of the 936 children who will be brought into town by virtue of new residential development, we estimate that 890 will attend public schools. To illustrate how these 890 children will be absorbed into Sharon's elementary schools, the following additional assumptions were needed:

- (1) One-tenth of the children will move into the town each year by school district. For example, to account for the 398 children expected in Heights, our calculations are based on adding 40 children per year to the district. Overall, we added 89 children under 11 years old to the Sharon population each year.
- (2) The ages of the children are in the same proportions as the townwide sample of 94 in 1985 reported on page 56 above.
- (3) We assume that all students who enter the school system will graduate fifth grade in the Sharon public schools. While some families who move into new homes over the next ten years will leave Sharon, these outgoing families will sell their homes to incoming families. On average, these families will contain an equivalent number of children at similar ages.

The tables found on the following pages illustrate the annual impact of the estimated in-migration in the three Sharon elementary schools. Although we predict that a moderate scenario for new

residential development in Sharon will bring an average of 89 children per year who will attend public schools, these children will not be added to the system in a single clusters.

Of a sampling of children who moved into new homes in 1985, 60% are too young to be enrolled in school; the remaining 40% are spread out between grades kindergarten through five.* We assume that the age distribution of children shown in 1985 will be constant over the coming ten years.

Student enrollment in Sharon's elementary schools changes every year. As the younger children enter kindergarten at (approximately) age 5, older children move through the grade system and graduate from the fifth grade when they are roughly 11 years old. We have accounted for this aging process in our model. Thus, of the total 890 children, our model predicts that maximum enrollment in the school system in a single year will be 471 (see Tables 29 and 30 on the following pages).

Please note, this analysis does not include a view of either existing households in Sharon or resales of older homes. It is likely that the number of elementary school children in existing households will fall over the coming ten years as household members age, and if the turnover of housing stock is limited. Thus, the net increase of elementary school enrollment will be less than the predicted impact of new development.

* Refer to Table 25 and the discussion on pages 55 and 56.

CONCLUSIONS

On the surface, the two models we developed present different descriptions of future enrollment in the three Sharon elementary schools. Part I presents a demographic analysis using state-of-the-art analytical techniques, and is anchored in Sharon's historic population and public school enrollment trends. The second model is a qualitative illustration of how future growth in Sharon may affect the town's school system, researched by assessing growth potential of undeveloped land. The conclusions differ on overall increase, and the relative impact within each school district as summarized below:

TABLE 31

SUMMARY OF FINDINGS
MAXIMUM INCREASE ABOVE 1986 ENROLLMENTS

	Model I Demographic Analysis:	Model II Build-out Analysis:
HEIGHTS	179	211
COTTAGE ST.	143	113
EAST	<u>94</u>	<u>147</u>
TOTALS	416	471

Given the differences in approach and techniques, it is not suprising that the results produced by the two methods are in disagreement. It is reassuring, however, to report that the most important result of our conclusions, the estimates of townwide enrollment growth, are in sync.

The realtors we consulted on this issue estimated that up to one-third of the new condos may be sold to Sharon residents. Fragmentary evidence, including buyers in small developments and deposits for new units, support this assumption.

The Impact of Private School Enrollments

A significant number of transactions of older homes in Sharon between long time Sharon residents and families who will send their children to private schools will offset the impact of condominium development on the public schools. This minimum impact appears possible as Sharon has become a popular home to Chassidic congregations from which students are sent exclusively to religious schools. Families within these communities will occupy homes which otherwise may be sold to parents who would send their children to public schools.

The potential immigration of Chassidic families is but one piece of an equation that may lead to increasing use of private elementary schools by Sharon parents. The fact that enrollments at the three public schools have reached capacity, and the coming years will see crowded classrooms followed by the use of temporary facilities, may cause parents who would normally send their children to public school in Sharon to consider the private school option. In this light, the new Strair School, which now has nursery school and kindergarten programs, and plans to expand by one grade a year through the fifth grade, may become an attractive alternative to the public schools for

parents of young children. At this time, however, School Department officials expect Strair to draw its attendance from local families whose children attend similar private schools spread within the metropolitan region between Boston and Providence, Rhode Island.

Impact of Growth in Sharon's Three School Districts

As we stated previously, the demographic methods of the first model account for population mobility within and from Sharon as reflected by the town's historical trends. Implicitly, these variables count young families who have moved to Sharon in the place of "empty-nesters." The model, however, based on inputs of observed data, cannot predict the effects of a one-time increase in local condominiums - in this case, the development of MacIntosh Farms and Cannon Forge - that is not like the recent past. It also cannot predict the immigration of families who will use private schools beyond the levels that Sharon's families traditionally have used private elementary education.

The build-out analysis does not include an overview of immigration and out-migration. However, unlike the demographic approach, we can add additional hypotheses to the model. Thus, we can project the effect of a sudden rise in "empty-nesters" who decide to purchase nearby condominiums as well as a rise in private school attendance within incoming families.

TABLE 32

EXPECTED GROWTH
IF 120 OF 160 FAMILIES WHO REPLACE "EMPTY-NESTERS"
SEND THEIR CHILDREN TO PUBLIC SCHOOL

Heights:	229
Cottage St.:	150
East:	<u>150</u>
Total:	529

If more than 120 families who move into the vacated homes send their children to public schools at the rate of Sharon's existing households, the impact of growth and change will be felt more in Cottage St. than in East. Fewer families will leave the greater impact in East. In all foreseeable cases under the build-out model, as well as forecast by the demographic model, the largest future growth will be in the Heights Elementary School district.

It is also possible that the planned condominium developments in Sharon and Foxboro will not change the pace that Sharon's aging households have been moving out of their homes and into apartments. In the past ten years a number of Sharon residents purchased condominiums in Walpole and other neighboring towns. If in fact the pace of future condominium demand by Sharon residents remains stable, then an sudden growth of Chassidic communities would serve to depress the scale of anticipated public school enrollments.

The conclusions we present are tentative because predicting the future is fraught with unknown pitfalls. No one knows if "empty-nesters" will flock to local condominiums, Chassidic families will move into Sharon in significantly larger numbers than over the past 10 years, if a hot regional housing market will sustain a demand for new construction, or if women living in Sharon will bear children at rates equivalent to recent years. We have studied the recent history of Sharon, its land use, population trends, and school enrollment patterns. Using two methods independently, we arrived at the same conclusion, that by 1997 approximately 400 students will be enrolled in the Sharon elementary school system above current levels.

require enrollment in Sharon's public elementary schools. Options for housing the additional elementary school students include:

1. Purchase temporary modular classrooms for use on elementary school grounds where needed.

Enrollments in the elementary school system already exceed capacity. To accomodate the new students, the town is being forced to purchase expensive modular classrooms which cost approximately \$120,000 each, exclusive of furnishings. Two have been purchased for the 1987-'88 school year, and will be placed on the Cottage St. and Heights campuses. The use of modular or temporary classrooms allow Sharon's school department to expand its capacity. However, these classrooms are a significant cash drain, and are not considered suitable as a quality educational facility.

2. Renovate and reopen the 18 classroom Intermediate School.

As required by the Massachusetts Department of Education, the Sharon School Department has commissioned a \$24,000 engineering and planning study to determine future use of the building. The study will analyze the existing physical conditions of the school, estimate the price-tag for renovation into a modern educational facility, and recommend the best use for the boarded-up building. The final report is expected by September 1, 1987.

3. Build permanent additions on one, two or three elementary school campuses.

Additions to existing elementary schools could be pegged to anticipated enrollment growth in each locality. However, as

construction would take place at schools in use, the building process may disrupt daily educational routines unless construction is timed for summer months.

A construction program of expanding existing schools may be less expensive than a new building if support services such as lunchrooms or first aid stations do not have to be expanded to adequately serve the additional students and staff. Small and well-designed additions will minimize the need to build non-program space such as hallways and restrooms. Moreover, enrollment growth may be accommodated by one or two additions along with adjustments in school district boundaries.

4. Build a new full service elementary school.

If our projections are correct, and 400 plus new students will be added to the Sharon elementary rolls in ten years, then the town will need a school on the scale of the East Elementary School. East is a 43,000 gross square foot building of 18 classrooms, housing 444 children (source: Sharon School Department). Using the estimate of \$150/gsf including furniture and equipment, a new school of adequate size will cost approximately \$6.5 million at 1987 value if constructed on land now owned by the school department.*

5. Expand the Junior High School.

A proposal to add 12 classrooms to the Junior High and expand its program to include Grade 5 is being considered. Elementary school would terminate at Grade 4, thus relieving the pressure of increased enrollments on the three elementary schools.

* The estimate of 150 /square foot is based on a recent study for the Town of Rockland for construction of additions to public schools.

staff may appear in very different form if the town chooses to build additions to existing schools instead of a new school building. For example, instead of hiring one principal for a new school, the town will be expanding the daily responsibilities of the three current elementary school principal positions. A detailed operating budget comparison lies well beyond the scope of this study.

Conclusions

According to our current projections, in 10 years the Sharon school system will be called upon to house an additional 400 students above current enrollments, and new facilities will be necessary to maintain quality educational services. A solution for housing these students will almost certainly entail construction, and as a consequence, an annual debt service for Sharon in addition to program operating expenses. The size of the debt service will depend on the cost of construction and interest rate for tax free bonds.

While we are confident that the estimates of enrollment growth presented in this report are the most accurate possible given the scope of this project, it is impossible to predict the future with certainty. The considerable expense involved in expanding the elementary school system makes careful consideration of need and realistic options an absolute necessity.

